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## ABSTRACT

Service organizations try to put more emphasis on strengthening its core competence for customization in order to survive intense competitive pressures. The most difficult thing in customization is that it is difficult to fully understand the service attribute. Moreover, it is not easy to utilize the service attribute in decision making for the service organization. In this study, we try to resolve the uncertainty of the service attribute using the service delivery system. The purpose of this paper is to develop a generic model that optimizes service value from the perspective of the service delivery system. Most studies on service value apply a multidimensional approach based on an empirical model and they measure the service value on the basis of benefits (service quality) and sacrifices (cost). We divide service delivery system into several stages and optimize the service value in terms of service quality and service cost of each stage in one optimization model. We applied our model to a dental service facility in Korea.

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## 1. Introduction

Service organizations recognize the strategic importance of maintaining a solid base of loyal customers for survival, growth, and financial performance (Ruiz, Gremler, Washburn, & Carrión, 2008). Successful firms in the service industry consider the delivery of customer value as a key strategy for achieving customer loyalty (Parasuraman & Grewal, 2000). Creating and maintaining customer value is more competitive in the service industry than focusing only on service quality or customer satisfaction (Vargo & Lusch, 2004). At the core of marketing is the development and maintenance of long-term relationships with customers, and to achieve it, customer value has to be grasped (Berger & Nasr, 1998). This concept of customer value is the basic framework of Customer Lifetime Value (CLV), and customer value focuses on service organization. However, creating and maintaining customer value should be based on the service value that the organization provides. Cronin, Brady, Brand, and Hightower (1997) defined service value as a function of service quality being provided from the service organization and sacrifice or “gets” and “gives”. In other words, service value is a concept containing all points of view such as customer’s point of view and service organization’s point of view. Most indicators of service value fail to conceptualize it correctly because the service value construct is not typically exact (Ruiz et al., 2008).

The objective of this paper is to develop a generic model that optimizes service value from the perspective of the service delivery system. We decompose the service delivery system into several stages and optimize the service value in terms of service quality and service cost of each stage in one integrated optimization model. The remainder of this paper is organized as follows. We review the literature on service value and service delivery system. Then, we present our proposed mathematical model that determines the optimal service quality and cost of the various stages of a service delivery system. An estimated function of service value is used to calculate the objective function of the optimization model. We present our model in context of a dental service facility in Korea and present a case analysis based on actual data. We conclude the paper with a discussion on the implications of our model.

## 2. Literature review

## 2.1. Service value

As customers demand higher service quality, they will make their purchase decision based on their perception on the level of service received. There has been a number of papers published in the academic literature related to the decision making about customers’ service purchase (see, for example, Bolton & Drew, 1991a; Dodds, Monroe, & Grewal, 1991; Heskett, Sasser, & Hart, 1990; Sheth, Newman, & Gross, 1991; Zeithaml, 1988). Historically, it was thought that the consumers’ decision making mechanism about service purchases focused only on service quality (Rabin, 1983; Rudie & Wansley, 1985; Thompson, DeSouza, & Gale, 1985; Parasuraman, Zeithaml, & Berry, 1985, 1988, 1994; Babakus

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& Boller, 1992; Cronin & Taylor, 1992; Zeithaml, Berry, & Parasuraman, 1993, 1996). However, this shows a dilemma since customers do not always buy quality services (Olshavsky, 1985). Furthermore, customers do not always purchase a service at the lowest cost. Thus, there is a tradeoff between service cost and quality in purchasing a service (Zeithaml, 1988). It expresses “gives” and “gets” used to define the meaning of service value. Service value is created by “gives” given to service organizations and “gets” derived from them, and service value is constantly changing by the tradeoff between the relevant “gives” and “gets”. McDougall and Levesque (2000) state that the meaning of service value is the gap between “gives” and “gets”. Patterson and Spreng (1997) explain that service value is the concept generated from differences between sacrifice (same meaning as “gives”) and benefit (same meaning as “gets”). Bolton and Drew (1991b) and Sweeney and Soutar (2001) measure service value by using cost and benefit based on multidimensional indicators and mention that a starting point for a service value study is SERVQUAL (Parasuraman et al., 1988). McDougall and Levesque (2000) define service value as “benefits received relative to costs paid”. The point of this prior literature is that service value is viewed from a combination of “gives” and “gets”.

Most studies on service value apply a multidimensional approach based on an empirical model as shown in Table 1, and they define service value on the basis of benefit and sacrifice. Table 1 lists the industry in which the study was conducted and types of empirical analysis performed. The variables used to define service value are also listed in the table. A ✓ in the table means that the variable considered is used to represent service value. According to the previous studies, service value depends on the overall customers' evaluation on service cost, non-monetary service time and service quality (Bolton & Drew, 1991b). Customers evaluate service value on the basis of the sacrifice needed to obtain the service (Brady, Robertson, & Cronin, 2001).

The most basic approach to a two-way tradeoff definition of service value is that of a ratio (Monroe, 1992). Babin, Darden, and Griffin (1994) argue that service value represents the tradeoff between cost and benefit and arises from both quality and price. Rust and Oliver (1994), in their work on service value, indicate that it

increases as quality which customers get increases and price which customers pay decreases. The relationship between service value and customer satisfaction is also well established in the literature (Zeithaml, 1988). McDougall and Levesque (2000) suggest that, in addition to customer satisfaction, service value may be a dominant mediator of repurchase intentions of customers. To this end, Cronin, Brady, and Hult (2000) state that there are two dimensions of service value: price which customer paid and service quality (or service time) which customer received. They conclude that customers place greater importance on the benefits received with respect to the cost rather than the quality of service itself. This shows that customers' perceptions of service value are important in managing service quality (Murray & Howat, 2002).

## 2.2. Service delivery system

Service value is not inherent in services and is rather experienced by the customers (Woodruff & Gardial, 1996). It is therefore considered as customers' evaluation in a specific situation of their purchase or use in a service encounter (Flint, Woodruff, & Gardial, 2002). Service value can be regarded as perceptions on customer satisfaction in a service encounter (Gil, Berenguer, & Cervera, 2008). This service encounter is the origin of the whole chain of evaluations on the service outcome (Lehtinen & Lehtinen, 1982). Service value may be viewed as the evaluation of what the customer receives compared to what the customer pays in a service encounter (Murray & Howat, 2002). Therefore, from the moment customers receive a service, the term service value describes an evaluation index (service value) of various factors that customers perceive about the organizations' delivery system. Therefore, it is necessary to understand the customers' service delivery system and support them in order to provide a good service value (Cronin et al., 1997). Employees and organizations have a gap in perceptions on service characteristics (e.g. good service) in service delivery (Chiang & Birtch, 2010). According to Chiang and Birtch (2010), reducing this gap is a good approach in increasing service value. A service encounter plays an important role in the customer evaluation of service performance (Brown & Swartz, 1989; Lehtinen & Lehtinen, 1982).

**Table 1**  
A summary of the literature on service value.

Author(s)	Service Industry	Research type (methodology)	Service value <sup>a</sup>		
			Service time	Service cost	Service quality
Chen (2012)	e-service (eBay, TradeMe, Auctionme, etc.)	Empirical study (regression analysis)	✓	✓	
Chiang and Birtch (2010)	Hotels	Empirical study (regression analysis)			✓
Ruiz et al. (2008)	Medical care, barbershop, dry cleaning, auto repair, health club, fast-food restaurant	Empirical study (SEM)	✓	✓	
Gil et al. (2008)	Banks	Empirical study (SEM and regression analysis)		✓	✓
Heinonen and Strandvik (2005)	Travel services, telephone services, hotel services, printing services, etc.	Empirical study (mapping matrix)			✓
Brady et al. (2001)	Fast-food restaurant	Empirical study (SEM)			✓
Murray and Howat (2002)	Public sports and leisure center	Empirical study (SEM)		✓	✓
LeBlanc and Nguyen (1999)	Education (business school)	Empirical study (ANOVA)		✓	✓
Kemp and Willetts (1995)	Government (public hospitals, primary and secondary schools, police, universities, prisons, legal aid, arts council, symphony orchestra, etc.)	Empirical study (regression analysis)		✓	
Liljander and Strandvik (1993)	Restaurant	Empirical study (conjoint analysis)			✓
Lee and Wu (2011)	e-service (airline ticket)	empirical study (SEM)		✓	✓

<sup>a</sup> Variables with ✓ are used to measure service value, SEM: Structural Equation Model.

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